# CLAIM AMENDMENTS

1    1. (currently amended)   A method for controlling input/output (I/O) operations of

2    a user's computer comprising the following steps:

3        implementing the user's computer as a virtual machine (VM);

4        including a virtual machine monitor (VMM) as a VM-transparent interface

5    between the VM and a physical computer system that includes at least one device;

6        in the VMM:

7            sensing a request for an I/O operation between the VM and the device;

8            performing a ~~predetermined~~ transformation of I/O data passing between

9    the VM and the device, said transformation being adjunct to necessary completion of

10   the request, as issued, for the I/O operation;

11       the transformation of the I/O data thereby being undefeatable by any ~~user~~ action

12   initiated via the VM.


1    2. (currently amended)   A method as in claim 1, in which:

2        the device is a display;

3        the I/O data is VM display data output from the VM and intended for display; and

4        the ~~predetermined~~ transformation is a replacement of at least a portion of the VM

5    display data with non-defeatable display data stored external to the VM but accessible

6    to the VMM;

7        further including the step of displaying the VM display data with the non-

8    defeatable display data overlaid.

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1    3. (currently amended)   A method as in claim 1, further including the following

2    steps:

3        filtering the I/O data with respect to at least one ~~predetermined~~ filtering condition;

4    and

5        performing the ~~predetermined~~ transformation of the I/O data only when the

6    filtering condition is met.

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1     4. (currently amended) A method as in claim 3, in which the filtering condition is

2 that the I/O data includes at least one ~~predetermined~~ restricted term.

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1     5. (currently amended) A method as in claim 3, in which the filtering condition is

2 that the I/O data is from a ~~predetermined~~ restricted source.

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1     6. (currently amended) A method as in claim 3, in which:

2     the I/O data includes image data;

3     the step of filtering the I/O data comprises detecting the presence of a

4 representation of a target image within the image data; and

5     the ~~predetermined~~ transformation is substitution of a representation of a

6 replacement image in place of the representation of the target image.

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1     7. (original) A method as in claim 6, in which:

2     the I/O data is in a non-character image format;

3     the target image is a representation of a restricted character string; and

4     the step of filtering the I/O data comprises applying character recognition to the

5 I/O data.

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1     8. (currently amended) A method as in claim 3, in which the ~~predetermined~~

2 filtering condition ~~in~~ is the presence in the I/O data of a copy protection indication.

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1     9. (currently amended) A method as in claim 1, in which the ~~predetermined~~

2 transformation comprises insertion into the I/O data of a source indication associated

3 with the VM.

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1     10.   A method as in claim 1, in which the transformation is time-varying.

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1     11. (original) A method as in claim 1, in which the device is a network

2 connection device.

3    12. (currently amended)   A method as in claim 11, in which the ~~predetermined~~

4    transformation is a bandwidth limiting of the I/O data being transferred between the VM

5    and the network connection device.

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1    13. (currently amended)   A method as in claim 11, in which:

2    the requested I/O operation is a transfer of the I/O data between the VM and the

3    network connection device; and

4    the ~~predetermined~~ transformation is a time delay of the transfer.

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1    14. (currently amended)   A method as in claim 11, in which:

2    the requested I/O operation is a transfer of the I/O data from the VM to a first

3    destination address via the network connection device;

4    the ~~predetermined~~ transformation is a redirection of the I/O data to a second

5    destination address different from the first.

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1    15. (currently amended)   A method as in claim 1, in which:

2    the device is a display;

3    the display renders data stored in a display map; and

4    the step of performing the ~~predetermined~~ transformation comprises altering a

5    selected portion of the display map.

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1    16. (currently amended)   A method as in claim 15, in which the step of altering

2    the selected portion of the display data comprises substituting ~~predetermined~~, non-

3    defeatable display data for the selected portion.

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1    17. (currently amended)   A method as in claim 15, in which the step of altering

2    the selected portion of the display data comprises changing all occurrences in the

3    display map of a display color to a ~~predetermined~~ replacement color.

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1    18. (currently amended)   A method as in claim 1, in which:

2    the device is a data storage device;

3    the requested I/O operation is a transfer of data between the VM and the storage

4    device; and

5    the step of performing the ~~predetermined~~ transformation comprises changing at

6    least a portion of  the data during the transfer between the VM and the storage device.

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1    19. (currently amended)   A method as in claim 18, in which the step of

2    performing the ~~predetermined~~ transformation of the I/O data comprises encrypting data

3    written by the VM to the data storage device and decrypting data read from the data

4    storage device by the VM.

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1    20. (currently amended)   A method as in claim 18, in which the step of

2    performing the ~~predetermined~~ transformation of the I/O data comprises compressing

3    data written by the VM to the data storage device and decompressing data read from

4    the data storage device by the VM.

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1    21. (currently amended)   A method as in claim 1, in which:

2    the device is a network connection device;

3    the requested I/O operation is a transfer of data between the VM and the network

4    connection device; and

5    the step of performing the ~~predetermined~~ transformation comprises changing at

6    least a portion of  the data during the transfer between the VM and the network

7    connection device.

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1    22. (currently amended)   A method as in claim 21, in which the step of

2    performing the ~~predetermined~~ transformation of the I/O data comprises encrypting data

3    written by the VM to the network connection device and decrypting data read from the

4    network connection device by the VM.

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1    23. (currently amended)   A method as in claim 21, in which the step of

2 performing the ~~predetermined~~ transformation of the I/O data comprises compressing

3 data written by the VM to the network connection device and decompressing data read

4 from the network connection device by the VM.

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1    24. (currently amended)   A method as in claim 1, in which the step of

2 performing the ~~predetermined~~ transformation of the I/O data comprises cryptographic

3 transformation of  the I/O data.

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1    25. (currently amended)   A method as in claim ~~1~~ 3, in which:

2     the VM supports a plurality of I/O modes;

3     the step of filtering is performed on I/O data corresponding to a first one of the

4 plurality of I/O modes; and

5     the ~~predetermined~~ transformation is applied to I/O data in a second one of the I/O

6 modes when the I/O data in the first I/O mode satisfies ~~the~~ a transformation-triggering

7 criterion.

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1    26. (original)   A method as in claim 25, in which the I/O modes include a video

2 mode and an audio mode.

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1   27. (currently amended)  A method for controlling input/output (I/O) of a user's

2   computer comprising the following steps:

3       implementing the user's computer as a virtual machine (VM);

4       including a virtual machine monitor (VMM) as a VM-transparent interface

5   between the VM and a physical computer system that includes at least one device that

6   carries out an I/O operation on the basis of device control data;

7       storing the device control data associated with the VM in a buffer in the VMM;

8       upon sensing a transformation command from an administrative system external

9   to the VM, entering replacement data into at least a portion of the buffer said

10  replacement data being entered as a processing step that is adjunct to the necessary

11  completion of the I/O operation;

12      the entry of the replacement data thereby being undefeatable by any ~~user~~ action

13  initiated via the VM.

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1   28. (currently amended)  A system for controlling input/output (I/O) operations of

2   a user's computer, comprising:

3       a virtual machine (VM) constituting the user's computer;

4       a virtual machine monitor (VMM) forming a VM-transparent interface between the

5   VM and a physical computer system that includes at least one device;

6       the VMM including means:

7           for sensing a request for an I/O operation between the VM and the device;

8   and

9           for performing a ~~predetermined~~ transformation of I/O data passing

10  between the VM and the device, said transformation being adjunct to necessary

11  completion of the request, as issued, for the I/O operation;

12      the transformation of the I/O data thereby being undefeatable by any ~~user~~ action

13  initiated via the VM.

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1        29. (original)  A system as in claim 28, in which the device is a display and the

2  I/O data is VM display data.

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1        30. (original)  A system as in claim 29, further comprising:

2        a display buffer within the VMM for storing the VM display data that is output from

3  the VM and is intended for display; and

4        transformation means located within the VMM for replacing at least a portion of

5  the VM display data stored in the display buffer with non-defeatable display data;

6        in which the display is provided for displaying the contents of the display buffer.

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1        31. (original)  A system as in claim 28, in which the device is a data storage

2  device.

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1        32. (original)  A system as in claim 28, in which the device is a network

2  connection device.

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